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NOTES ON CLIMATOLOGY.

BY

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RECENT CONTRIBUTIONS TO ANTARCTIC METEOROLOGY.—During the last few months a considerable number of papers relating to the meteorological conditions of the Antarctic have been published. Arctowski, the meteorologist of the *Belgica* expedition, has contributed to *Ciel et Terre* (Brussels) the following: *Résultats préliminaires des Observations météorologiques faites pendant l'Hivernage de la Belgica*: I. *Température de l'Air* (Aug. 1, 1899, 245–248); II. *Pression Barométrique* (Aug. 16, 1899, 269–275); III. *Roses des Vents*; and IV. *Phénomènes atmosphériques* (Oct. 1, 1899, 353–364). Arctowski has also published *Sur les Conditions météorologiques des Régions antarctiques* (*Ciel et Terre*, Oct. 16, 1900, 379–384), in which he compares the observations made by him on the *Belgica* with those made at Cape Adare on the Borchgrevink expedition. The meteorological results of the *Belgica* expedition have likewise been included in Dr. Frederick A. Cook's *Through the First Antarctic Night* (New York, Doubleday & McClure Co., 1900), in which the author also makes some interesting notes on the physiological effects of the Antarctic night, and have been briefly discussed by Supan in the *Meteorologische Zeitschrift* for May, 1900. Woeikof contributed a paper under the title *Arktis und Antarktis* to the *Meteorologische Zeitschrift* for February, 1900 (75–79), and Borchgrevink discussed the *Southern Cross* results in the *Geographical Journal* for last June. These data have been reprinted in the *Quarterly Journal of the Royal Meteorological Society* (London) for October, 1900 (292–296). Fricker's *The Antarctic Regions*, recently published (New York, The Macmillan Co.), includes a chapter on climate. The valuable meteorological results obtained on the recent expeditions of the *Southern Cross* and of the *Belgica* may be said to have increased the appetite of meteorologists for the still more extended contributions to Antarctic meteorology which may be expected from the coming English and German expeditions.

THE ARGENTINE AND INDIAN WHEAT CROPS.—The November number of the *Bulletin of the Bureau of American Republics* calls attention to some interesting facts in connection with the climatic

control of the time of harvest in Argentina and in India, and the relation between the time of the harvest and the price of the wheat. The harvests of the Argentine Republic and of India take place during what is known in other wheat-growing sections of the world as the "dead season." In the former country, the harvest usually begins late in November in the northern latitudes, and progresses southward until early in February. In India, on the other hand, the harvest commences late in February in the south and progresses northward until early in May. The shipments of wheat from these two countries consequently come to the world's markets at a time when the stock on hand has been considerably depleted, and, therefore, these late supplies have a ruling effect on prices.

THE HARVARD METEOROLOGICAL STATIONS IN PERU.—In this *Bulletin*, Vol. XXXI., pp. 368–369, mention was made of the valuable pioneer work in meteorology which has been carried on by the Harvard College Observatory in connection with its Southern Station at Arequipa, Peru. Professor Pickering's Annual Report as Director of the Harvard College Observatory contains the unwelcome announcement that the meteorological observations at all the stations except Arequipa were discontinued on Jan. 1, 1901. This means the abandonment of the highest meteorological station in the world, on El Misti (19,200 feet), as well as of the interesting station at the old Inca capital, Cuzco, and of those at Molendo (100 feet), La Joya (4,150 feet), Alto de los Huesos (13,300 feet), Misti Base (15,600 feet), Vincocaya (14,600 feet), and Puno (12,500 feet). The reasons which have induced Professor Pickering to discontinue these stations are excellent; but meteorologists will nevertheless receive with regret the announcement that this step has been taken. Professor Pickering points out that observations of great accuracy cannot be expected where the observers are necessarily men of limited education and experience. To maintain trained observers at all these stations would mean a greatly increased expense. In the region in which these observations have been taken the uniformity of meteorological conditions from year to year is so striking that but little would probably be gained by continuing routine observations during a long series of years. Although the step which has been taken is to be regretted, meteorologists are under the greatest obligations to the Harvard College Observatory for the splendid contribution it has already made to the climatology of Peru.

PROPERTY LOSS BY LIGHTNING IN THE UNITED STATES IN 1899.—Professor A. J. Henry, of the United States Weather Bureau, considers the property loss by lightning in the United States during 1899 in the *Monthly Weather Review* for October last. The total number of reports received of buildings struck and damaged or destroyed by lightning was 5,527, or about three times as many as were received during the year 1898. In addition to the above, 729 buildings caught fire, as a result of exposure to other buildings that had been set on fire by lightning. The approximate loss in the 2,825 known cases was \$3,016,520, or an average loss of nearly \$1,100 per building. The number of insured buildings struck by lightning in the United States in 1899, according to the Chronicle Fire Tables, was 2,760, with an average loss of over \$1,400 per building. The great majority of buildings struck were not provided with lightning rods, as was the case in 1898; but 70 buildings provided with rods were also struck and damaged. Professor Henry concludes that a conservative estimate of the total loss of property by lightning during the year would probably be \$6,000,000.

RAINFALL AND ALTITUDE IN ENGLAND.—The Assistant Secretary of the Royal Meteorological Society, William Marriott, contributes a paper on the *Rainfall in the West and East of England in Relation to Altitude above Sea-Level* to the *Quarterly Journal of the Royal Meteorological Society* for October. The mean monthly and mean annual rainfalls at the English and Welsh stations were obtained for the ten-year period 1881-90, and the stations were grouped according to their altitude above sea-level. The annual rainfall being decidedly heavier in the western portion of the country than in the eastern portion, it seemed desirable to separate the western from the eastern stations. Those stations were classed as "western" which drain to the west, and those which drain to the east were classed as "eastern." The stations were then grouped together for each 50 feet up to 500 feet, and above that altitude for each 100 feet. The results show that there is a general increase in the amount of rainfall as the altitude increases. There are some irregularities at the higher altitudes, but these, Mr. Marriott thinks, are undoubtedly due to the small number of stations employed. The values when plotted show in a very striking manner that the rainfall is considerably greater in the west than in the east, the excess being nearly a quarter. When, however, the west and east values are combined, the curve becomes much smoother, the increase of rainfall according to altitude being much more uniform.

The graphic results show, further, that the monthly rainfall in the west is subject to a much greater range than in the east; and that in the west the maximum at all altitudes occurs in November (and not in January, as is popularly supposed), but in the east generally in October. One of the most marked features in all the diagrams, both west and east, is the great rise in the rainfall from June to July. The increase of rainfall with altitude is thus summarized by Mr. Marriott:

100 feet +	9 per cent.	600 feet +	5 per cent.
200 " +	3 "	700 " +	38 "
300 " +	3 "	800 " +	3 "
400 " +	14 "	900 " +	4 "
500 " +	1 "	1,000 " -	21 "

ALTITUDE AS A SOLUTION OF THE ACCLIMATISATION PROBLEM.—

Once again comes the suggestion or implication—this time from Hon. Charles Denby (*Independent*, New York, December)—that the problem of the acclimatisation of the white race in the tropics can be solved by establishing residences and sanatoria at a few thousand feet above sea-level. Mr. Denby refers to the plateau of Benguet, in the northwestern part of the island of Luzon, which averages about 4,000 feet above sea-level, and up to which the Government proposes to build a railway. The existence of this province, in the opinion of Mr. Denby, will solve many of the questions which have arisen out of our possession of the Philippines, because it will furnish a fine sanitarium and a healthy location for the seat of government. While mountain and plateau stations make living in many parts of the tropics possible for the white man, for the reason that, with increasing altitude above sea-level, there is a general decrease of temperature and of humidity, yet one of the chief characteristics of tropical climates—viz., the monotony—remains as marked a feature aloft as at sea-level. It is the monotony of the climatic conditions in the tropics which is one of the difficulties with which a Northerner has to contend. The constant repetition, from day to day and from season to season (for the seasonal changes are, as a whole, very slight in the tropics), of the same conditions has a deadening, enervating effect, which cannot be counteracted by seeking a residence at a higher altitude. The spur of the seasons, which is so important an influence in giving the northern peoples their vigor and energy and "push," is lacking in the tropics. No mountain climate can supply this missing quality. Mountain stations are very important, because they do furnish some relief from

the excessive heat and humidity of the lowlands, and are above the zone of many tropical diseases; but they do not solve the problem of acclimatisation. The northern winter—disagreeable as it often is—has contributed much toward making our northern races what they are. Let us recognise clearly that tropical mountain stations are all-important in making life more bearable in the tropics, and in keeping white men and women free from many diseases that are prevalent in the lowlands; but let us also beware of overrating the value of these same high-level stations.